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THE BERG PROPOSAL FOR IMPROVING THE STRUCTURE OF SOVIET PRICES



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THE BERG PROPOSAL
FOR IMPROVING THE STRUCTURE OF SOVIET PRICES

A Soviet mathematician, Aksel I. Berg, who is chairman of the Council on Cybernetics of the Academy of Sciences, recently has proposed that research on devising a practical method for determining prices by means of linear programming techniques be stepped up sharply to make possible the early use of this method to improve the structure of Soviet wholesale prices. 1/ Academician Berg contends that present Soviet wholesale prices and the new prices being set under the general revision now in progress are determined arbitrarily and do not measure true (social) costs of production and thus make it impossible for Soviet planners to make efficiently planning decisions that require comparisons of alternative costs. Reiterating an argument made originally by Soviet mathematician L. V. Kantorovich, Berg further contends that linear programming techniques can be used to measure accurately social costs of production and that the general adoption of wholesale prices determined on the basis of these techniques could aid in improving radically the effectiveness of planning decisions. To speed research in this field, Berg recommends that a group composed of leading mathematical economists, mathematicians, and computer experts be established in one of the leading governmental organizations such as the State Scientific-Economic Council (Gosekonomsovet) and be given high priority to further this work.

Soviet research on methods of determining prices by means of linear programming techniques has evolved from input-output principles developed by Harvard economist Wassily Leontief in the US which in turn were developed into optimizing techniques -- linear programming -- more or less independently by Kantorovich in the USSR and Dantzig in the US. Linear programming essentially is a mode of deriving a numerical solution to the problem of allocating scarce resources among competing products. In solving problems of resource allocation such as maximizing output, linear programming involves the calculation of the value of other products given up to produce a given product. This value is the "shadow"

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or scarcity price of that product -- the price that is mathematically determined by the available supply of resources and the existing state of technology, given the demands of the society.

Berg's proposal could revive a recent public controversy between Soviet mathematicians and mathematical economists who emphasize a pragmatic approach to current economic problems and the more orthodox economists. The latter reject those approaches (such as Kantorovich's) that imply acceptance of Western economic theory, but they offer no practical alternatives. The use of prices determined by linear programming techniques in planning originally was proposed by Kantorovich in 1959. 2/ At that time, Kantorovich's proposal was widely condemned as a complete acceptance of Western economic doctrines, 3/ and it was shelved. Research on practical methods for determining prices by means of linear programming techniques has been continued on a limited scale, however, in a few research institutions. These institutions include the Institute of Electronic Controlling Machines of Gosekonomsovet, under Academician I.S. Bruk, and the Laboratory for Economic-Mathematical Methods of the Academy of Sciences, under Academician V.S. Nemchinov. 4/

Although orthodox economists as well as conservative bureaucrats probably will oppose Berg's proposal, the climate of opinion in the USSR at the present time is far more receptive to the use of linear programming techniques to determine prices than it was at the time of the original proposal by Kantorovich. The use of linear programming for other purposes has gained widespread acceptance, and the ranks of economists openly critical of the deficiencies both of present industrial wholesale prices and of the new prices being set under the present revision have grown during the intervening period. Moreover, the tolerant reception by the Khrushchev regime of the recent Liberman proposal for tying bonus incentives in industry to profitability suggests that the regime now may be prepared to adopt radical changes if it can be demonstrated that they would lead to improvements in economic management and planning. Thus the Kantorovich proposal stands a greater chance for adoption now than it did in 1959.

Because of the numerous theoretical and practical problems to be solved as well as the vast amount of heretofore unavailable data needed to

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be collected, considerable time would be required before the determination of prices by means of linear programming techniques could be placed on an operational basis. For example, the Institute of Electronic Controlling Machines in 1961 determined prices experimentally from an interbranch balance table that divided the economy into only 70 industrial classifications. 5/ Interbranch balance tables containing many times this number of industrial classifications would be required to make operational use of such prices in determining actual wholesale prices in the USSR. If the Berg suggestion were to be adopted, therefore, it would come too late to have an important influence on the present revision of wholesale prices of industrial products that now is scheduled for completion during 1963. 6/

Berg proposes that shadow prices be used to set actual wholesale prices in the Soviet economy. Although wholesale prices set in this manner would not measure social costs as efficiently as the equilibrium prices reached by a market economy under conditions of ideal competition, these prices could be markedly superior to present Soviet prices in making planning decisions such as whether or not to construct a new factory or to adopt a new technique. On the other hand, the use of shadow prices to set wholesale prices would in itself have relatively little effect on the behavior of individual enterprises. Combined with the Liberman proposal or with more far-reaching measures to decentralize decision-making, however, the effect of the Berg proposals on individual enterprises would be increased.

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